



Solving Ontology Wranglings ala MMI

Presenter : Luis Bermudez (SURA / MMI)

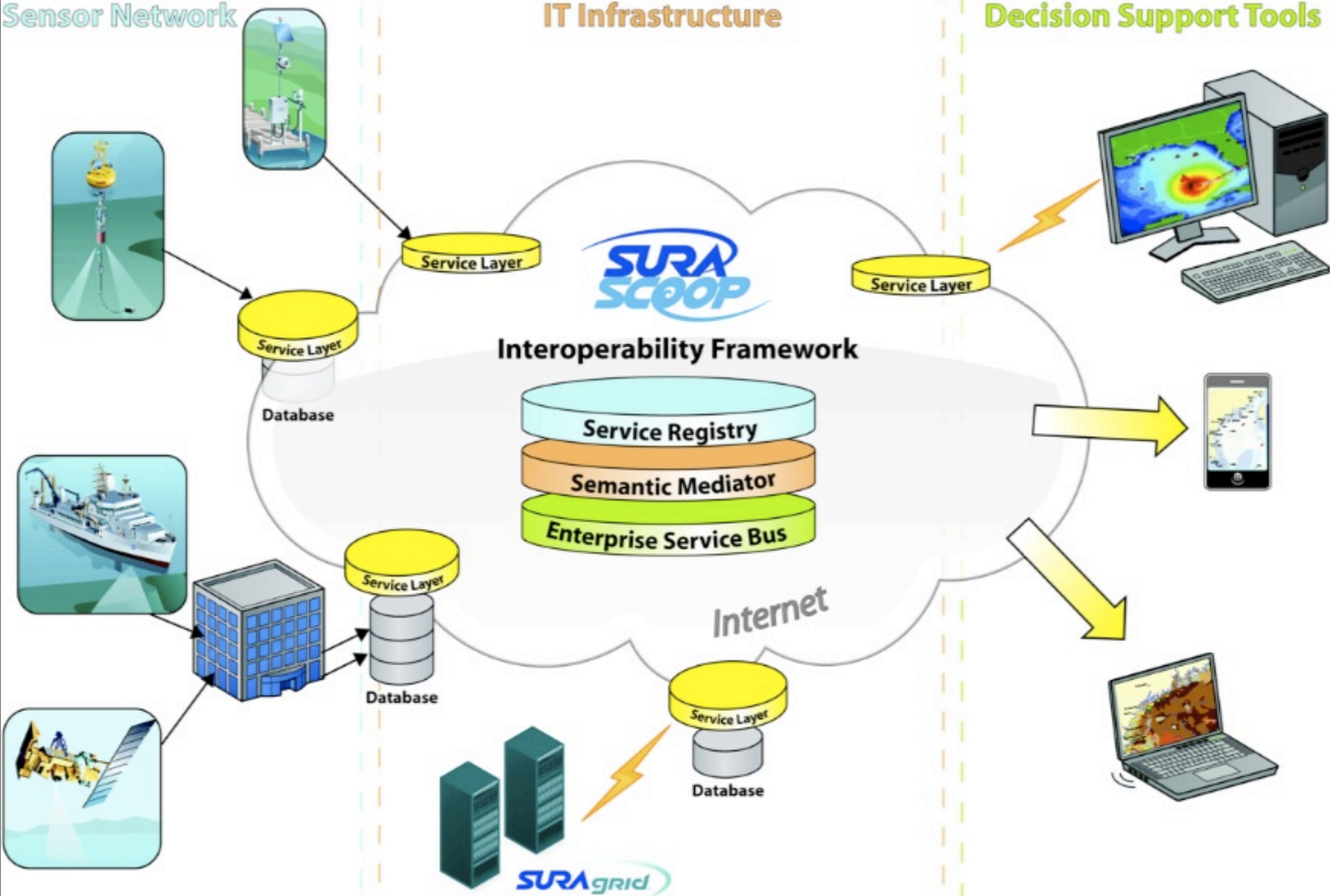
ESIP Federation's Water Cluster Water
Oct 1, 2009

The Web

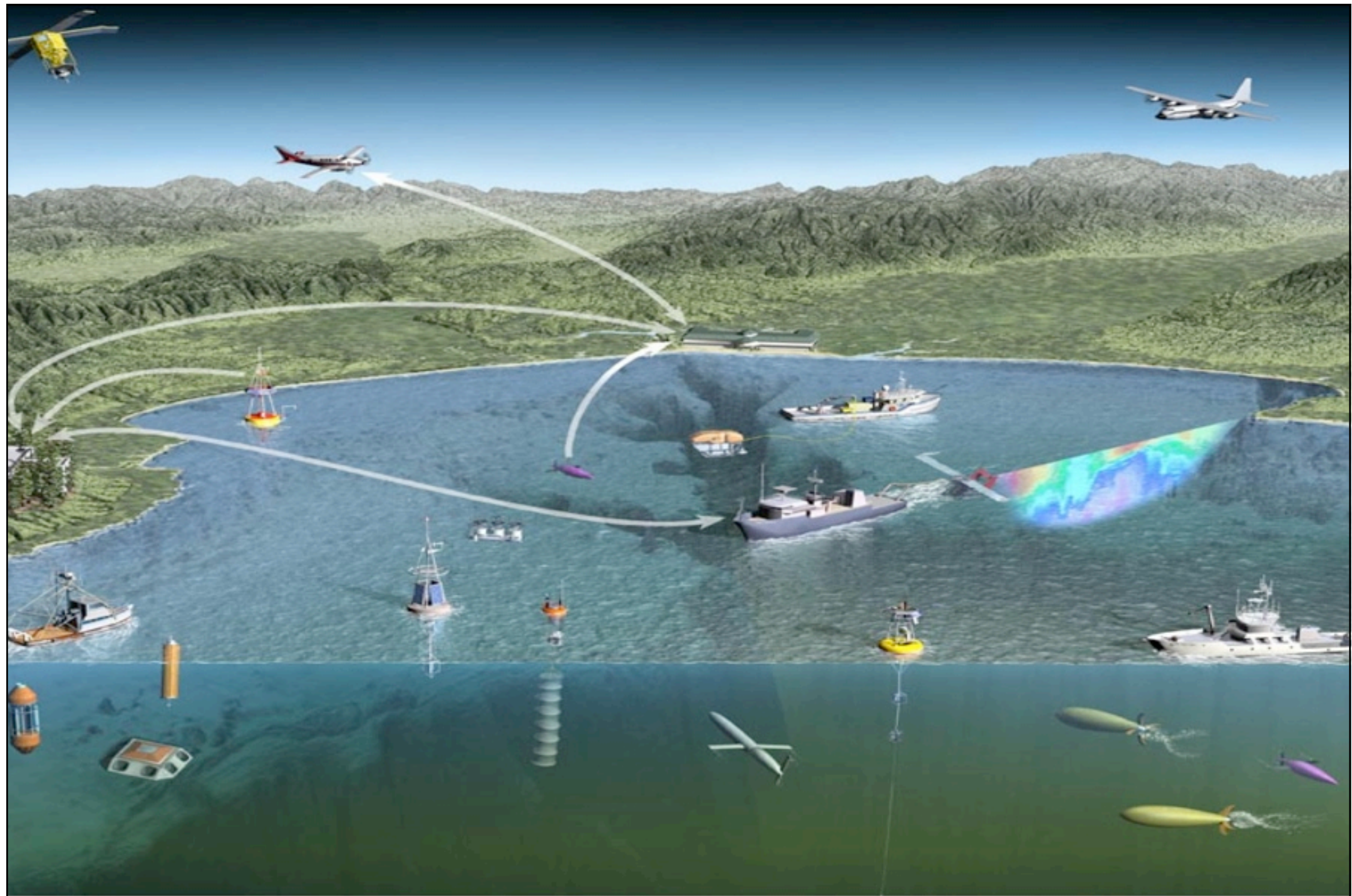
Sensor Network

IT Infrastructure

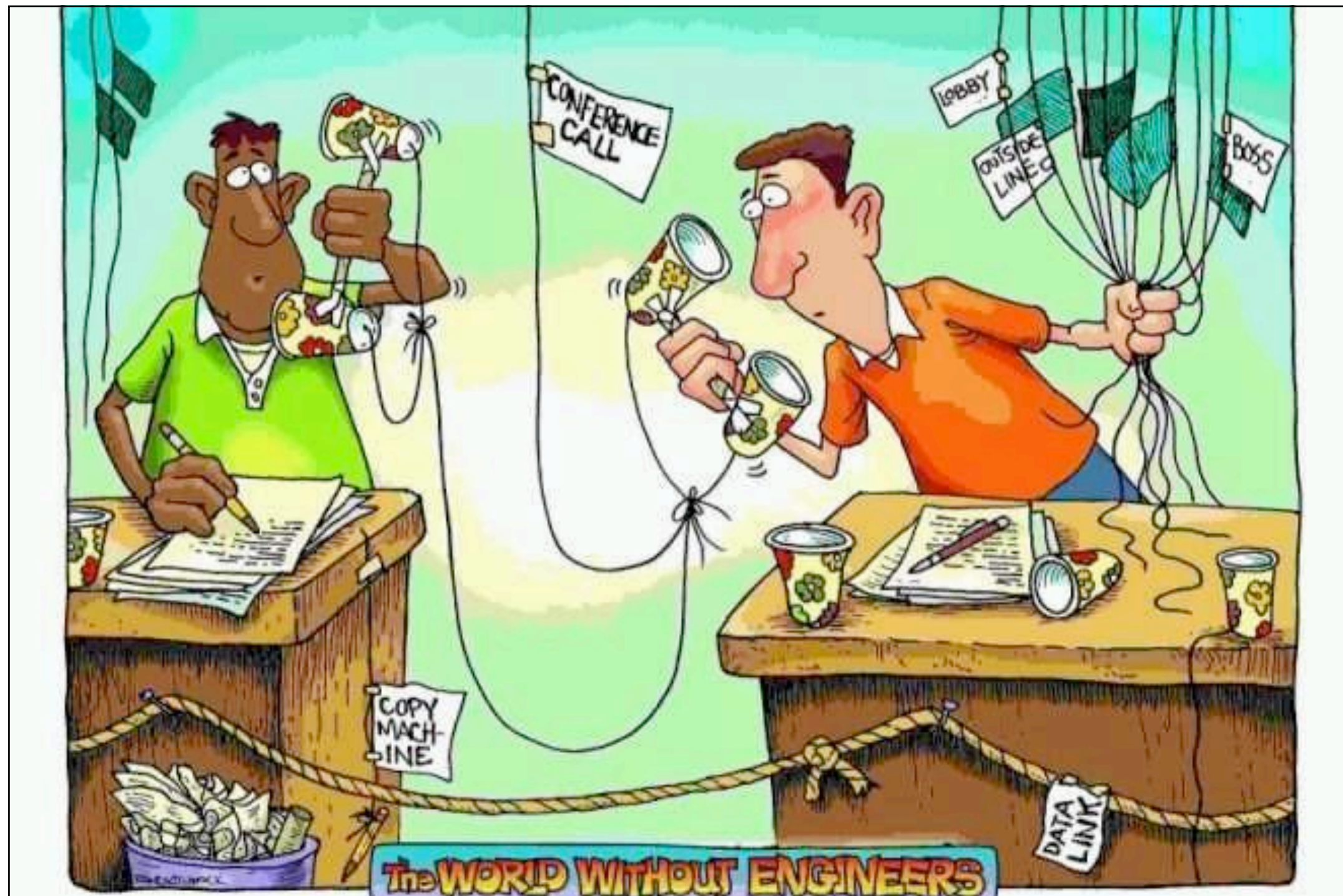
Decision Support Tools



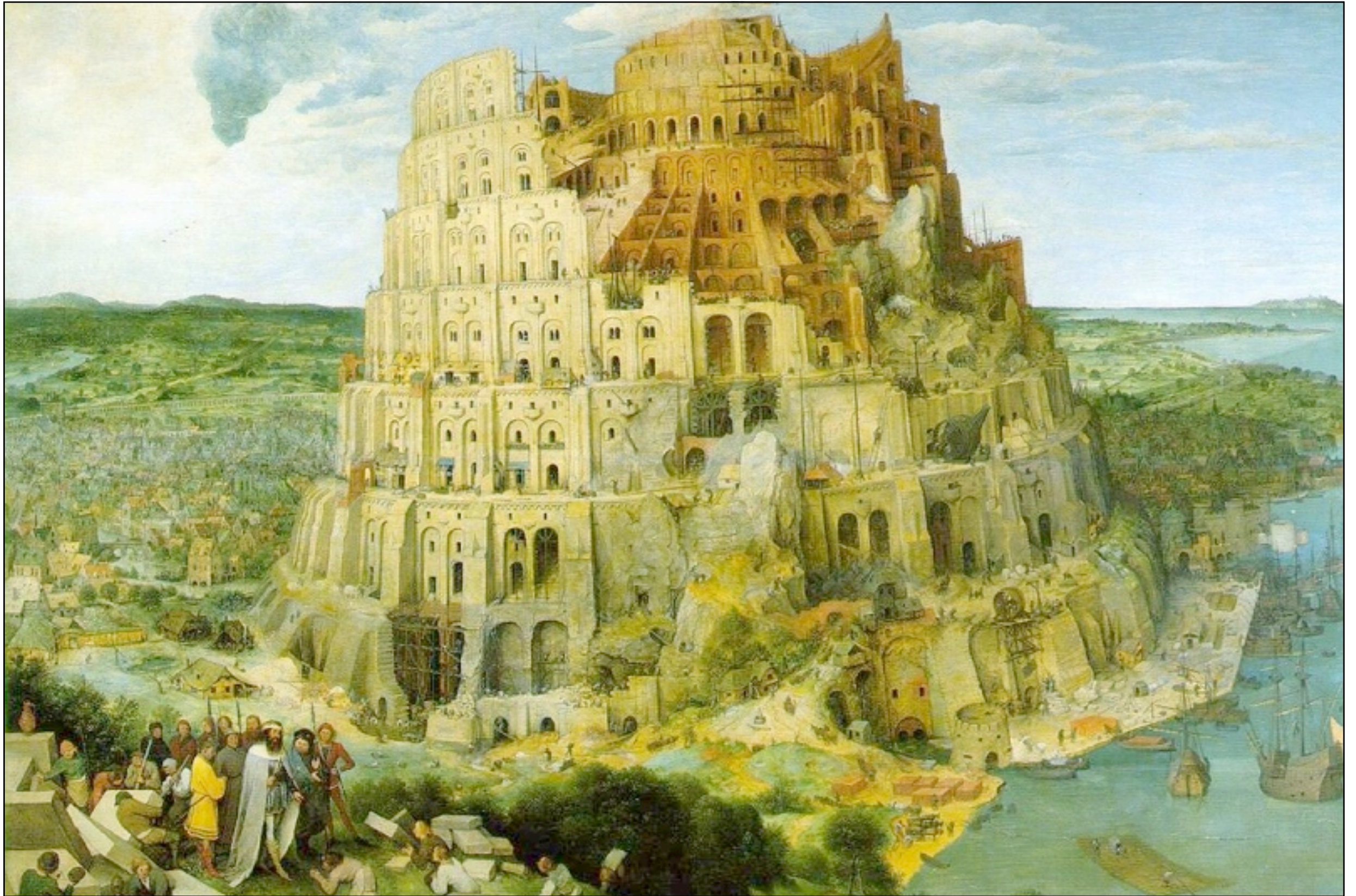
Observing Systems Coordination



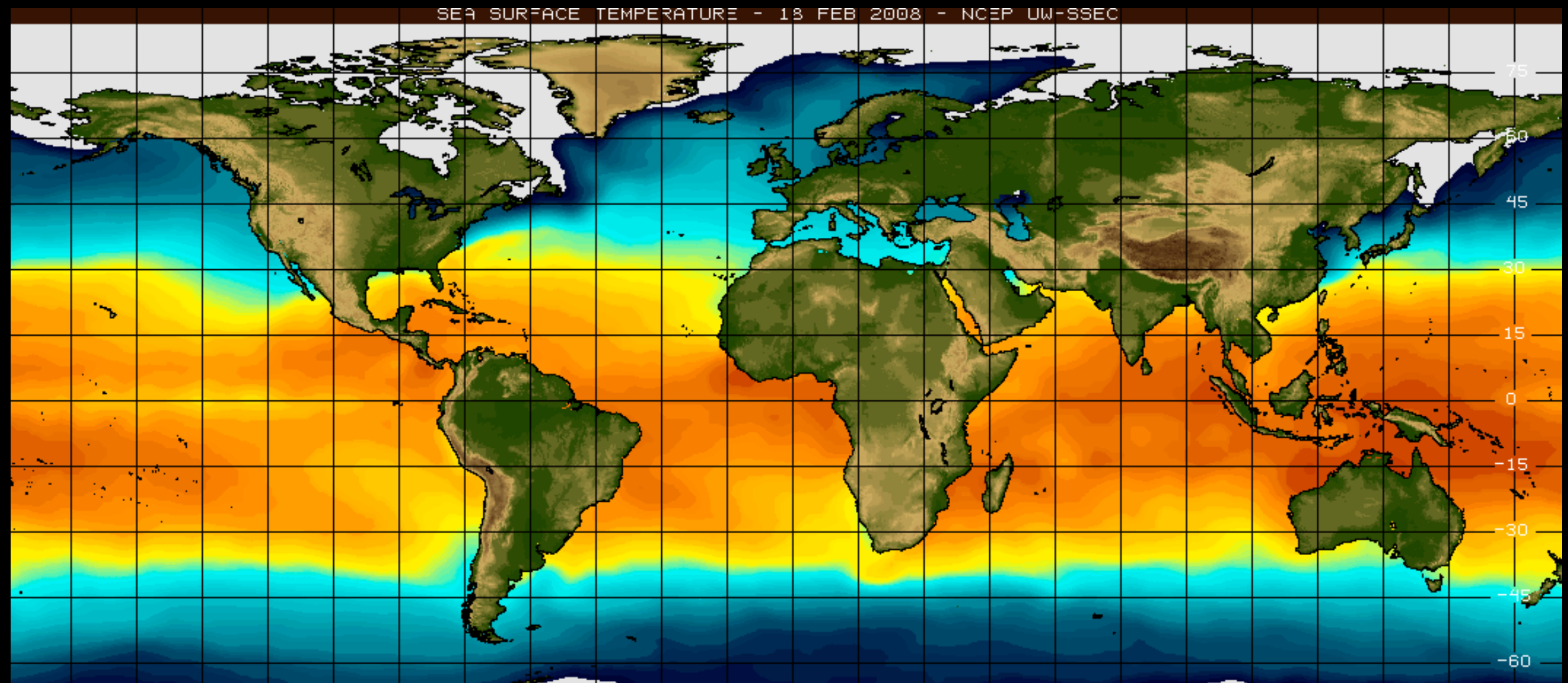
2010, there will be 10,000 telemetric devices
for every human in the planet (E&Y)



WWW and Internet are Great !



Semantic Heterogeneity



SST, sea water temperature,
water temperature, temp ...



SST ?

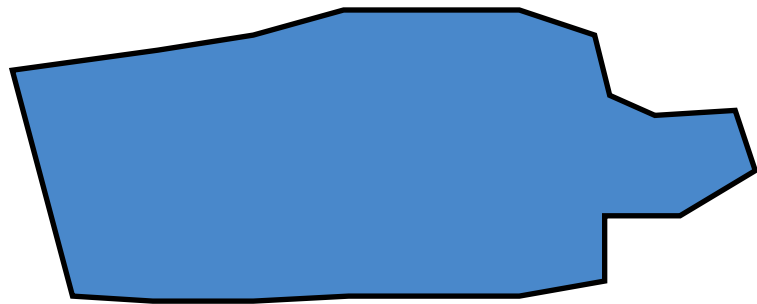


SST Records.
1978 formed
Record Label

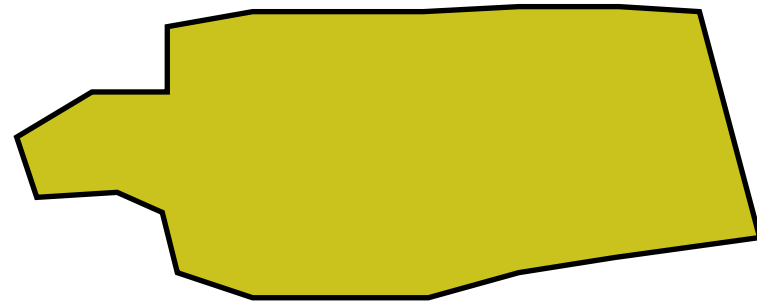
Supersonic
transport (SST)

Well...

why don't we do semantic
mediation ?



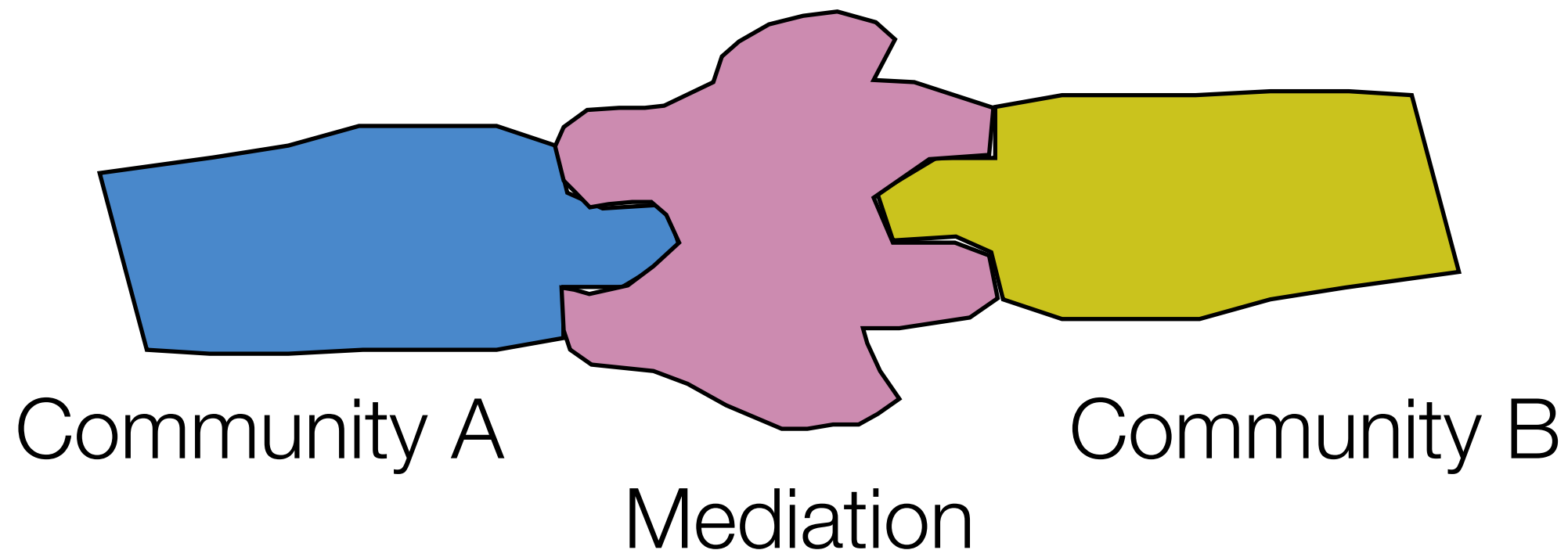
Community A



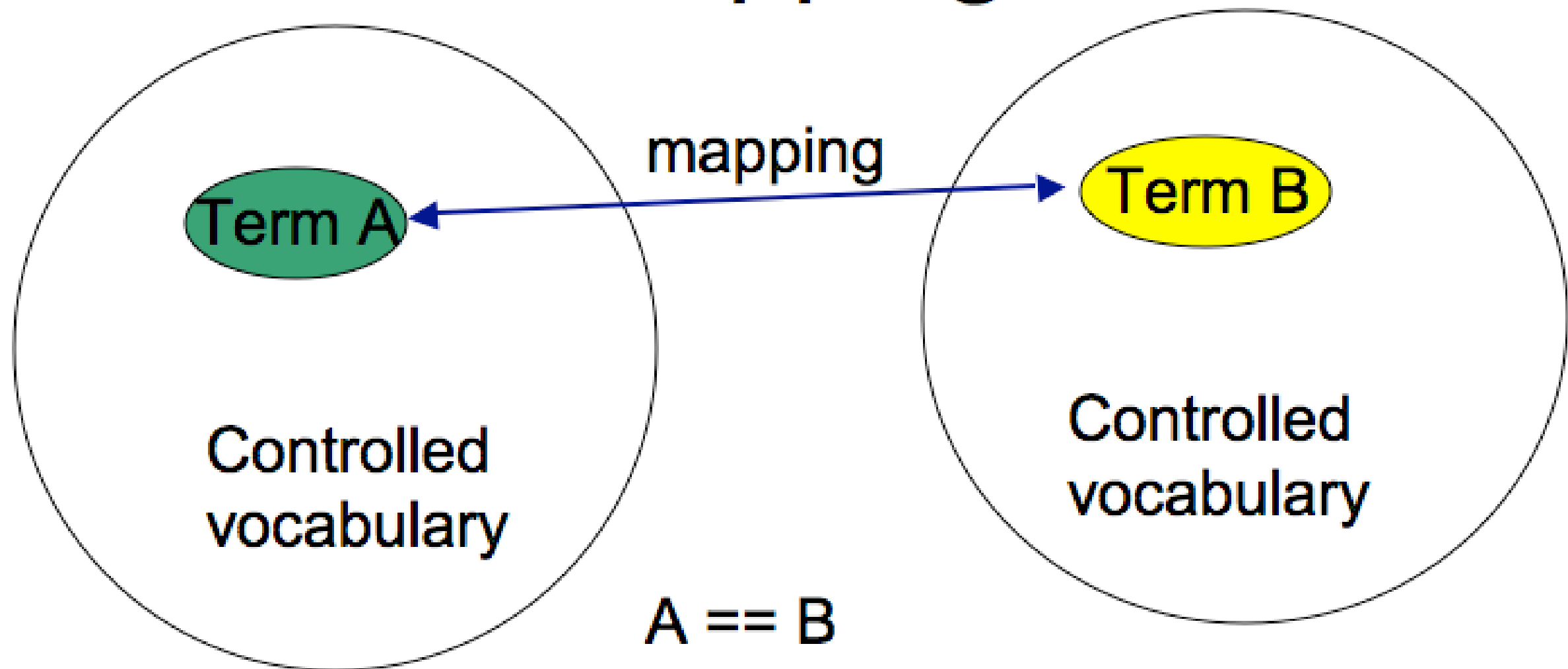
Community B

Well...

why don't we do semantic
mediation ?



Mapping



$A == B$

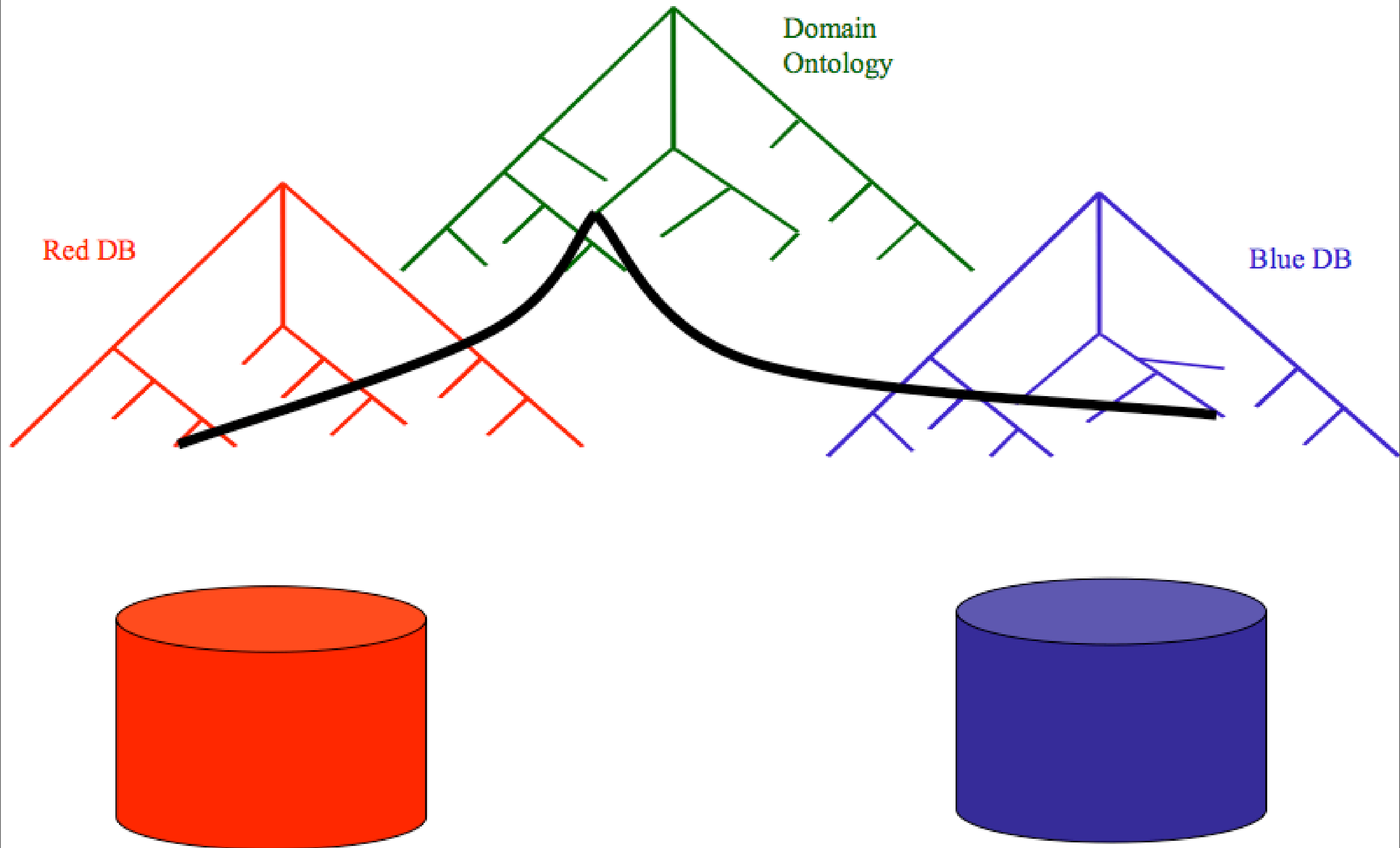
A subclass of B

A is a type of B

A is Narrower Than B

...

Interoperability



Marine Metadata Interoperability (MMI): a Collaborative Project

John Graybeal Lead



Luis Bermudez
Original Technical Lead

Carlos Rueda
Technical Lead


What type of semantic framework do we need ?

Community Framework

- Controlled vocabulary creation
- Registration/storage of vocabularies
- Metadata association
- Versioning
- Semantic query support
- Term mapping
- Mapping repository
- Vocabulary and term URI resolution

The MMI Ontology Registry and Repository

Register



Marine Metadata Interoperability

Ontology Registry and Repository

alpha

[bermud](#)

Review and RegisterCancel

(creating new ontology) -

► Metadata details

▼ Contents

Synopsis of ontology contents:

Please specify your ontology file.

☒ Local file: Browse...

☐ Preserve original base namespace

Load ontologyDetails

MMI Portal 1.5.0.alpha29 (20090929182050)

Create from scratch

Review and Register


Cancel







(creating new ontology) -

► Metadata details

▼ Contents

Vocabulary contents:

 Class name:

 		
	name	description
 1		

MMI Portal 1.5.0.alpha29 (20090929182050)

▼ Metadata details

General

Usage/License/Permissions

Original source

? Resource type: qualityFlag (<http://mmisw.org/ont/mmi/theme/qualityFlag>)

? Full title: Argo QA/QC Flags

? Content creator:

? Ontology creator: Stephanie Watson

? Brief description:

QA/QC flags used in Argo

? Keywords: quality, QA, QC, Argo

? Link to original vocabulary:

? Link to documentation: <http://argo.jcommops.org/FTPRoot/Argo/Doc/argo-quality-control-ma>

? Authority abbreviation: argo

? Contributor(s): Annie Wong, Robert Keeley, Thierry Carval, and the Argo Data Management Team.


Update and Revisions

Available versions for <http://mmisw.org/ont/argo/qualityFlag>

URI	Name	Author	Version	Submitter
▶ http://mmisw.org/ont/argo/20081116T040146/qualityFlag	Argo QA/QC Flags	Stephanie Watson	20081116T040146	graybeal
▶ http://mmisw.org/ont/argo/20081113T203523/qualityFlag	Argo QA/QC Flags	Stephanie Watson	20081113T203523	swatson

Close

Browse



Marine Metadata Interoperability
Ontology Registry and Repository alpha

Create vocabulary
Upload

☒ Submitter

-All-
aisenor
amilan
bermud
carueda
carueda3
caruedagm
cchandler
cdip
dallison
dhr.sfsu@gmail.com
graybeal
haag
haines
jfredericks
kwalz

Name	Author
▶ AGU Index Terms	AGU
▶ ARGO Instruments	ARGO
▶ ARGO Parameters	ARGO
▶ Argo QA/QC Flags	Stephanie Watson
▶ Authority Vocabulary	MMI
▶ CDIP Term Vocabulary	CDIP
▶ CeNCOOS water monitoring subset and extension of CF parameter vocabulary	Dale Robinson
▶ CF NetCDF Standard Names	CF Metadata
▶ Climate and Forecast (CF) standard names parameter vocabulary	Luis Bermudez
▶ Demo in the q2o break out ^T	q2o
▶ DRDC and CF Mapping	Anthony W. Isenor
▶ DRDC Atlantic NADAS Parameter Codes	Anthony W. Isenor
▶ EPIC Key File (Units)	Pacific Marine Environmental Laboratory (NOAA)
▶ Extended Continental Shelf (ECS) Device Vocabulary	Amilan
▶ Integrated Global Ocean Services System (IGOSS) QA/QC Flags	Stephanie Watson
▶ IOOS Vocabulary Version 1	Stephanie Watson
▶ IRD QA/QC Flags	Stephanie Watson

Use - Get the RDF

<http://mmisw.org/ont?form=rdf&uri=http://mmisw.org/ont/argo/qualityFlag>

```
<omv:description>QA/QC flags used in Argo</omv:description>
<omv:version>Latest terms per null</omv:version>
<omvmmi:origMaintainerCode>argo</omvmmi:origMaintainerCode>
<omv:keywords>quality, QA, QC, Argo</omv:keywords>
<omv:hasContributor>Annie Wong, Robert Keeley, Thierry Carval, and the Argo Data M
<omv:acronym>qualityFlag</omv:acronym>
<omv:uri>http://mmisw.org/ont/argo/qualityFlag</omv:uri>
<omv:documentation>http://argo.jcommops.org/FTPRoot/Argo/Doc/argo-quality-control-
<dc:description>QA/QC flags used in Argo</dc:description>
<omvmmi:shortNameUri>http://mmisw.org/ont/mmi/theme/qualityFlag</omvmmi:shortNameU
<dc:title>Argo QA/QC flags</dc:title>
<dc:contributor>Annie Wong, Robert Keeley, Thierry Carval, and the Argo Data Manag
<omvmmi:creditRequired>not specified</omvmmi:creditRequired>
</owl:Ontology>
<owl:Class rdf:about="http://mmisw.org/ont/argo/qualityFlag/Qualityflag">
  <rdfs:label>qualityflag</rdfs:label>
</owl:Class>
<owl:DatatypeProperty rdf:about="http://mmisw.org/ont/argo/qualityFlag/code">
  <rdfs:domain rdf:resource="http://mmisw.org/ont/argo/qualityFlag/Qualityflag"/>
  <rdfs:label>Code</rdfs:label>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:about="http://mmisw.org/ont/argo/qualityFlag/description">
  <rdfs:domain rdf:resource="http://mmisw.org/ont/argo/qualityFlag/Qualityflag"/>
  <rdfs:label>Description</rdfs:label>
</owl:DatatypeProperty>
<owl:DatatypeProperty rdf:about="http://mmisw.org/ont/argo/qualityFlag/source_notes">
  <rdfs:domain rdf:resource="http://mmisw.org/ont/argo/qualityFlag/Qualityflag"/>
  <rdfs:label>Source Notes</rdfs:label>
</owl:DatatypeProperty>
<Qualityflag rdf:about="http://mmisw.org/ont/argo/qualityFlag/_7">
  <source_notes>Argo from from IODE Summary Spreadsheet QualityFlags.xls</source_not
  <description>Not used</description>
  <code>7</code>
```


SPARQL Queries

```
SELECT ?property ?value
```

```
WHERE
```

```
{<urn:ogc:def:datatype:iso-19107::gm_polygon>
```

```
?property ?value. }
```



Your SPARQL query:

[SPARQL](#) (Simple
query language
information [here](#)
Use this form to
[Registry and Repository](#)
Both GET and POST

CONSTRUCT examples

```
CONSTRUCT { ?s ?p ?o } WHERE { ?s ?p ?o . } LIMIT 20
```

```
SELECT ?s ?p
```

```
PREFIX dc: <http://purl.org/dc/elements/1.1/>  
CONSTRUCT { ?s dc:creator ?creator }  
WHERE { ?s dc:creator ?creator . }
```

```
PREFIX dc: <ht  
SELECT ?s ?c  
WHERE { ?s dc:
```

```
PREFIX rdf: <http://www.w3.org/1999/02/22-rdf-syntax-ns#>  
PREFIX owl: <http://www.w3.org/2002/07/owl#>  
CONSTRUCT { ?class rdf:type owl:Class. }  
WHERE { ?class rdf:type owl:Class. } LIMIT 20
```

```
PREFIX rdf: <h  
PREFIX owl: <h  
SELECT ?class  
WHERE { ?class
```

<http://mmisw.org/ont/sparql.html>

SPARQL Result






```
<?xml version="1.0"?>
<rdf:RDF
  xmlns:rdf="http://www.w3.org/1999/02/22-rdf-syntax-ns#"
  xmlns:rdfs="http://www.w3.org/2000/01/rdf-schema#"
  xmlns:j.0="http://mmisw.org/ont/ogc/def/">
  <j.0:Ogcdef rdf:about="urn:ogc:def:datatype:iso-19107::gm_polygon">
    <j.0:uri>urn:ogc:def:datatype:ISO-19107::GM_Polygon</j.0:uri>
    <rdfs:label>urn:ogc:def:datatype:ISO-19107::GM_Polygon</rdfs:label>
    <j.0:description>A Polygon is a special surface that is defined by a
      single surface patch</j.0:description>
  </j.0:Ogcdef>
</rdf:RDF>
```


Handling of URNs

<http://mmisw.org/portal/#http://mmisw.org/ont/ogc/def>

?		
	uri	description
1	urn:ogc:def:crs:OGC:1.3:CRS83	NAD83 longitude-latitude B.4 in OGC 06-042
2	urn:ogc:def:dataType:ISO-19107::GM_Aggregate	A (heterogeneous) geometry collection that includes one or more geometry members
3	urn:ogc:def:ebRIM-ClassificationScheme:UNSD::GlobalRegions	Standard country or area codes and geographical regions for statistical use (UNSD)
4	urn:ogc:def:crs:OGC:1.3:AUTO42003:99:8888	Auto orthographic B.9 in OGC 06-042
5	urn:ogc:def:ebRIM-RegistryPackage:OGC::Root	Root package containing all extension packages
6	urn:ogc:def:ebRIM-RegistryPackage:OGC::Basic	Basic extension package
		Describes the service endpoints and

Mapping

-  Exact match
-  Close match
-  Narrower than
-  Broader than
-  Related match

Working ontologies:

A: <http://mmisw.org/ont/igoss/qualityFlag/> -- Integrated Global Ocean Services System (IGOSS) QA/QC

B: <http://mmisw.org/ont/argo/qualityFlag/> -- Argo QA/QC Flags

Search the following ontologies:

Search for:

Select: Selected: 1 out of 14 element(s)

☐ ▶ A:_7

☐ ▶ A:_5

☒ ▼ A:_4

http://mmisw.org/ont/igoss/qualityFlag/_4

label:4

code:4

description: The element appears erroneous
source notes: Integrated Global Ocean Services
System from IODE
Summary Spreadsheet











Search the following ontologies:

Search for:

Select: Selected: 1 out of 14 element(s)

☐ ▶ B:_0

☐ ▶ B:_6

☐ ▶ B:_5

☒ ▼ B:_3

http://mmisw.org/ont/argo/qualityFlag/_3

label:3

code:3

description: Probably bad data (spike-
gradient- ? if other tests passed)

source notes: Argo from IODE Summary

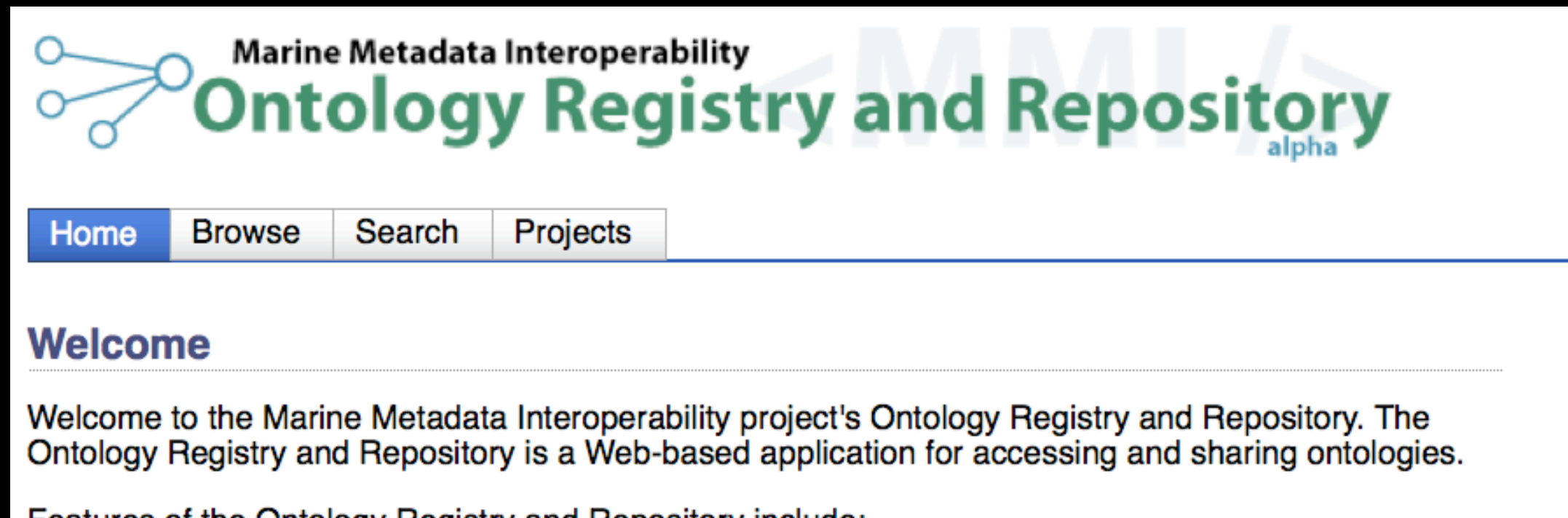
Select:

Mappings:

☐ ▶

A:_4.  B:_3.

Try it ! Gives us feedback..



Tutorial: <http://marinemetadata.org/mmiorrusman>

Link to registry: <http://mmisw.org>

Luis' email: bermudez@sura.org